SITE NEED STATEMENT

General Reference Information

Need Title: **Remote Hydraulic Demolition of Structures**
Need Code: NV25-0200-07
Need Summary: Cheaper, faster and safer methods of demolishing concrete and metal structures and large objects, which minimize direct worker contact, are needed. There are many large, complex structures and objects to be demolished within the deactivation and decommissioning (D&D) project at the Nevada Test Site. The present technology involves personnel demolishing these structures and objects using hand-held mechanical cutting tools. This is time-consuming work, and places workers at risk from cuts and abrasions, from industrial-type accidents, and from potential contamination. The innovative technology would support the Environmental Restoration (ER) Lifecycle Baseline for Industrial Sites Deactivation and Decommissioning (D&D).
Origination Date: August 1, 2001
Need Type: Technology
Operations Office: NNSA/NV
Geographic Site Name: Nevada Test Site
Project: NV214/Industrial Sites
National Priority:
Operations Office Priority: 7 of 13

Problem Description Information

Operations Office Program Description: The NNSA/NV Environmental Restoration Program encompasses activities that assess the degree of contamination resulting from the testing program at the Nevada Test Site, the Nellis Air Force Range, the Tonopah Test Range, and eight offsite locations, and performs actions required by federal and state regulations. The objectives of the Program are to: (1) identify the nature and extent of the contamination; (2) determine its potential risk to the public and the environment; and (3) perform the necessary corrective actions in compliance with applicable regulatory guidelines and requirements.

Need/Problem Description: Cheaper, faster and safer methods of demolishing concrete, metal structures and large objects, which minimize direct worker contact, are needed. There are many large, complex structures and objects to be demolished within the deactivation and decommissioning (D&D) project at the Nevada Test Site. The present technology involves personnel demolishing these structures and objects using hand-held mechanical cutting tools. This is time-consuming work, and places workers at risk from cuts and abrasions, from industrial-type accidents, and from potential contamination. The innovative technology would support the Environmental Restoration (ER) Lifecycle Baseline for Industrial Sites Deactivation and Decommissioning (D&D), plus other demolition sites at the NTS.

Functional Performance Requirements: The requirements for this innovative technology include:

- Equipment installed on hydraulic excavator
- Ability to cut metal, crush concrete, and cut rebar in concrete using a minimum number of pieces of equipment or equipment attachments
- Ability to load cut or crushed material into open-top waste containers
- Cycle time minimized to increase productivity
- Down time minimized by use of easily replaceable wear items

Definition of Solution: Deployment of a hydraulic demolition tool able to cut metal, crush concrete and cut rebar in concrete, with the operator positioned away from the actual work location, and that complies with the other performance requirements listed above.
Targeted Focus Area: Deactivation and Decontamination
Potential Benefits: Shorter demolition schedule with smaller crew size, which will produce significant cost savings. Operator separated from actual demolition activity, which will reduce industrial-type accidents and potential exposure to contamination.
Potential Cost Savings: Estimated to be $500,000
Potential Cost Savings Narrative: The work scope on which the cost savings was estimated consists of demolishing the Area 25 R-MAD Decontamination Facility. Cost savings result from the shorter demolition time and reduced crew size compared to the baseline approach.

Technical Basis:	Use of hand-held demolition tools is slow and labor-intensive compared to the use of hydraulic tools mounted on mobile equipment. Set-up and preparatory activities such as connecting power sources and erecting scaffolding also results in increased work durations.
Cultural/Stakeholder Basis:	D&D of unused, contaminated structures at the NTS is important to stakeholders because it reduces the risk (perceived) of these structures remaining in place.
Environmental, Safety and Health Basis:	Use of hand-held demolition tools such as saws or thermal cutting devices places the worker at risk for cuts or abrasions, back injuries or repetitive motion injuries, and heat stress. Thermal cutting also has the potential for causing fires or explosions.
Regulatory Drivers:	Federal Facilities Agreement and Consent Order
Milestones:	Not applicable
Material Streams:	Contaminated concrete and metal rubble from D&D activities
TSD System:	Not applicable
Major Contaminants:	Cobalt, cesium, and uranium
Contaminated Media:	Metal and concrete structures and tanks
Volume/Size of Contaminated Media:	Exact volume unknown, several large concrete and steel structures
Earliest Date Required:	FY 2002
Latest Date Required:	FY 2006

Baseline Technology Information

Baseline Technology Process:	Demolition of buildings and structures has been baselined using a number of different methods. Activities can be broken down into internal strip-out of equipment and utilities; craft dismantlement of structures (i.e., roofs, bearing walls, etc.); demolition using mechanical equipment (i.e., bulldozer); and demolition using explosives (i.e., beam cutting). Depending on the building/structure the one or a combination of these methods will be employed.
Life-cycle Cost Using Baseline:	$2,000,000
Uncertainty on Baseline Life-cycle Cost:	The baseline costs are based on current estimates. Most of the activities have not been performed at the NTS. Therefore, an uncertainty factor of +/- 20% should be applied.
Completion Date using Baseline:	FY 2006 for D&D projects

Points of Contact (POC)

Contractor End User POCs:	Wayne Johnson, BN, Environmental Restoration Project Manager – Office: 702-295-0573; Fax 702-295-7761; E-mail: johnsowf@nv.doe.gov
DOE End User POCs:	Janet Appenzeller-Wing, EFD Project Manager – Office: 702-2095-1113; E-mail wing@nv.doe.gov